

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

Paper No. 34

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEVEN S. KWON
and DHARAM V. VADEHRA

Appeal No. 1996-2208
Application 08/180,194

HEARD: April 4, 2000

Before WILLIAM F. SMITH, SCHEINER and ADAMS, Administrative Patent Judges.
SCHEINER, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the final rejection of claims 18 through 22 and 25 through 43, all the claims remaining in the application. Independent claims 18, 31 and 35 are representative:

18. A process for treating enzymatically hydrolyzed protein comprising mixing a Lactobacillus helveticus culture with a slurry of enzymatically hydrolyzed protein containing polypeptides, wherein the hydrolyzed protein is a hydrolysate selected from the group consisting of hydrolyzed plant protein, hydrolyzed meat protein and hydrolyzed fish protein, and incubating the mixture at a temperature of from 45EC to 60EC to obtain an incubated mixture containing debittered hydrolysate.

31. A process for treating a cheese comprising enzymatically hydrolyzing a cheese thereby obtaining a hydrolysate including polypeptides, mixing a Lactobacillus helveticus culture with a slurry of the hydrolysate and incubating the mixture at a temperature of from 45EC to 60EC to obtain an incubated mixture containing debittered hydrolysate.

35. A process for treating casein comprising enzymatically hydrolyzing casein to obtain a hydrolysate from the casein including polypeptides, mixing a Lactobacillus helveticus culture with a slurry of the hydrolysate and incubating the mixture at a temperature of from 45EC to 60EC to obtain an incubated mixture containing debittered hydrolysate.

The references cited by the examiner are:

Buchanan et al. (Bergey's Manual), "Bergey's Manual of Determinative Bacteriology," Eighth Edition, page 582 (1974).

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Visser, "Contribution of enzymes from rennet, starter bacteria and milk to proteolysis and flavour development in Gouda cheese. 2. Development of bitterness and cheese flavour," Neth. Milk Dairy Journal, Vol. 31, pp. 188-209 (1977).

Frey et al. (Frey), "Peptidases and proteases of lactobacilli associated with cheese," Milchwissenschaft, Vol. 41, (10), pp. 622-24 (1986).

Bartels et al. (Bartels II), "Accelerated ripening of Gouda cheese. I. Effect of heat-shocked thermophilic lactobacilli and streptococci on proteolysis and flavor development," Milchwissenschaft, Vol. 42 (2), pp. 83-88 (1987).

Bartels et al. (Bartels I), "Accelerated ripening of Gouda cheese. 2. Effect of freeze-shocked *Lactobacillus helveticus* on proteolysis and flavor development," Milchwissenschaft, Vol. 42, (3), pp. 139-44 (1987).

Eur. Pat. App. 0 223 560 (Parker)

May 27, 1987

Claims 18 through 22 and 25 through 43 stand rejected under 35 U.S.C. § 103.

The evidence relied on by the examiner in support of this rejection is the source of some confusion.

In the Examiner's Answer (Paper No. 25), Bartels I, Bartels II, Visser, Frey and Bergey's Manual are cited as evidence of obviousness. In their Reply Brief, appellants maintained that the examiner's characterization of Visser was factually incorrect in certain respects (Paper No. 26, pages 4 and 5). The examiner conceded the point in the Supplemental Examiner's Answer, but argued that "the admitted prior art" and "the other references applied provide the missing teachings" (Paper No. 28, pages 2 and 5). Appellant and the examiner evidently agree that Parker represents what the examiner

refers to as “the admitted prior art” (Paper No. 28, page 3 and Paper No. 29, pages 3 and 9 through 11). With the filing of the Supplemental Examiner’s Answer, the rejection of the claims appears to be premised on the combined disclosures of Bartels I, Bartels II, Visser, Frey, Bergey’s Manual and Parker.

We reverse.

DISCUSSION

The claimed invention is directed to a process of debittering enzymatically hydrolyzed protein by incubating a slurry of the hydrolyzed protein with a Lactobacillus helveticus culture. Claim 18 specifies that the protein is plant, meat or fish protein, while claims 31 and 35 specify that the protein is cheese or casein, respectively; certain of the claims require incubating at a particular pH, or heat shocking the bacterial culture before it is added to the hydrolyzed protein. All of the claims require incubating the hydrolyzed protein with the L. helveticus culture within a specific temperature range to obtain a debittered product: from 45EC to 60EC (claims 18 through 21, 25 through 33, 35 through 37, 39 and 40); 50EC to 60EC (claims 22, 34 and 38); or 45EC to 55EC (claims 41 through 43).

Bartels I evaluates the effects of adding freeze-shocked cultures of L. helveticus to milk during cheese manufacturing. Freeze-shocked bacterial cultures are thawed and added to milk; the milk is ripened for one hour at 31EC; rennet extract is added and the

curd is cut after another thirty minutes; heated water is added to raise the temperature of the curd-whey slurry to 38EC, and the slurry is held at that temperature for thirty-five to forty-five minutes after which the curd is fused into a block. The whey is drained and the curd is brined and stored at 13EC for six months. The addition of freeze-shocked L. helveticus to the milk reduces bitterness and enhances flavor development in the final product. Bartels II evaluates the effects of adding heat-shocked L. helveticus to milk in an otherwise similar process, with similar results.

Visser discusses the relative contributions of enzymes from rennet, starter bacteria and milk to the development of bitterness and cheese flavor in Gouda cheeses.

Frey teaches that crude, cell-free extracts of L. helveticus have relatively high aminopeptidase activity and, when added to cheese, should accelerate ripening without development of an excessively bitter flavor.

Bergey's Manual teaches the identifying features and optimal culture conditions for L. helveticus. The optimal temperature for growth is 40-42EC, and the maximum temperature is 50-53EC. In addition, the taxonomic history of L. helveticus shows that the organism was once called Thermobacterium helveticum.

Parker subjects a "wide variety of proteins and protein extracts" to a primary enzymatic hydrolysis with a proteinase to produce a primary hydrolysate containing "bittering substances," and subsequently incubates the primary hydrolysate with a freeze-

dried extract of bacterial cells (not L. helveticus) containing aminopeptidase to convert the bittering substances to “flavour-neutral substances.” The process “is conveniently carried out in aqueous conditions at temperatures from 10 and [sic, to] 50EC, more preferably from 25 to 45EC.” Pages 4 and 5.

According to appellants, “[a]n uncontested difference between the claimed subjects [sic] matter and the primary Bartels references include [sic], for all claims, the temperatures of treating with L. helveticus” (Main Brief, page 25). We agree with appellants that the dispositive question “is whether the teachings of the [secondary references] would have led one of ordinary skill to modify the Bartels [I and II] references such that one would have manipulated substances as claimed at the temperatures claimed” (Id., page 26).

The examiner believes that:

[T]he claimed invention would have been prima facie obvious as a whole to one of ordinary skill in the art at the time the claimed invention was made, in view of the close similarity between the process of Bartels et al. (I) and (II) and the present process of using L. helveticus in a protein hydrolysis process, and the recognition in the art of submitting a variety of proteins of different origins to hydrolysis processes for debittering purposes, as well as adjusting process parameters, such as temperature and cell concentration, for optimization purposes as evidenced by the teachings of Visser, Frey et al. and Bergey’s Manual, because of the advantages in culturing a known thermophilic organism such as L. helveticus with a reasonable expectation of a faster growth rate, a concomitantly increased production of enzymes and a faster reaction rate. (Examiner’s Answer, page 5).

and that:

[T]he combined teachings of the references in conjunction with the admitted state of the prior art . . . reasonably teach to one of ordinary skill in the art that a variety of protein products in need of debittering would reasonably be expected by one of ordinary skill in the art at the time the claimed invention was made to be debittered successfully by treatment with L. helveticus at least at temperatures up to and including 53EC, which is within the required range. (Supplemental Examiner's Answer, page 5).

We disagree with the examiner's conclusions. While one might recognize from Bergey's Manual that L. helveticus survives at temperatures up to 53EC, and from Parker that bacterial extracts in general can be used over a wide temperature range, these facts alone do not provide a reason, suggestion or motivation to modify the incubation temperature of the debittering processes disclosed by Bartels I and II. As stated in Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1629 (Fed. Cir. 1996) (citation omitted), "It is well-established that before a conclusion of obviousness may be made based on a combination of references, there must have been a reason, suggestion, or motivation to lead an inventor to combine those references."

We have no doubt that the prior art could be modified in a manner consistent with appellants' specification and claims, but the fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested its desirability. In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). Here we find no reason or suggestion stemming from the prior art which would have led a person having ordinary skill to the claimed method. In our judgment, the only reason or

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suggestion to combine the references in the manner proposed by the examiner comes from appellants' specification. The rejection of the claims under 35 U.S.C. § 103 is reversed.

REVERSED

William F. Smith)	
Administrative Patent Judge)	
)	
)	
)	BOARD OF PATENT
Toni R. Scheiner)	
Administrative Patent Judge)	APPEALS AND
)	
)	INTERFERENCES
)	
Donald E. Adams)	
Administrative Patent Judge)	

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